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Stillbirth at Patan Hospital, Nepal

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ABSTRACT

Introductions: Stillbirth (SB) is one of the most common adverse outcomes of pregnancy. The aim of this study was to determine the SB rate and to identify the likely causes contributing to SB.

Methods: This cross-sectional study was conducted at Patan Hospital from 15th June 2014 to 14th June 2017 for all the cases of SBs, at or after 22 weeks, birth weight of 500 gm or more. The perinatal outcome, demographic profile, fetal characteristics, causes and contributing factors were analyzed.

Results: There were 262 SB out of total 23069 deliveries, (11.24 per 1000) and 119 (46.12%) had antenatal check-up (ANC) at Patan Hospital. The 214 (82.95%) SB were among 20-34 years mothers, 133 (51.55%) being multigravida. Antepartum SB were 234 (89.31%), macerated 213 (81.30%), birth weight <1000gm 86 (32.82%) and male 156 (59.54%). The intrauterine growth restriction (IUGR) was present in 60 (22.90%), unexplained casue in 43 (16.41%), prematurity 28 (10.69%), congenital anomalies 26 (9.92%), pre-eclampsia 19 (7.25%), gestational diabetes, and abruptio placenta each 13 (4.96%). Delay in seeking care in 202 (78.30%) was a potential contributing factor.

Conclusions: The SB was 11.24/1000 births. The causes in descending order were IUGR, unexplained, prematurity, congenital anomalies, pre-eclampsia, gestational diabetes and abruptio placenta. Delay in seeking care was found as a potential contributing factor.

Keywords: antenatal check-up (ANC), birth weight, intrauterine growth restriction (IUGR), stillbirth

INTRODUCTIONS

Stillbirth, is defined by the World Health Organization (WHO) / the International Statistical Classification of Diseases (ICD) as the death of a fetus weighing 500 grams or more; if birth weight is unknown, by gestational age of 22 weeks or more; or, if both these criteria are unknown, by crown-heel length of 25 cm or more.¹ Stillbirth is one of the most common adverse outcomes of pregnancy, accounting for half of all perinatal mortality. Each year an estimated 4 million stillbirths are reported, with 98% occurring in developing countries.² Stillbirth rates are important indicators of the quality of obstetric care available in any settings.³

The aim of this study was to determine the stillbirth rate and to identify the likely causes contributing to stillbirth delivery which would help to improve the quality of the existing obstetric care at Patan Hospital.

METHODS

This cross-sectional study was conducted at the Department of Obstetrics and Gynaecology, Patan Hospital, a tertiary care teaching hospital of Patan Academy of Health Sciences (PAHS), Lalitpur, Nepal. The data were collected from the monthly perinatal audit reports and the patient medical record files retrieved from the Medical Record Section. All cases of stillbirths at 22 weeks or more, or fetal birth weight of 500 grams or more delivered from 15th June 2014 to 14th June 2017 were included in the study. Stillbirths that occurred before the onset of labour were classified as antepartum

stillbirths while those occurring after the onset of labour were classified as intrapartum stillbirths. In this study, a fresh stillbirth was defined as the intrauterine fetal death during labour or delivery where the fetus showed no signs of degenerative changes. Likewise, a macerated stillbirth was defined as the intrauterine fetal death sometime prior to delivery where the fetus showed signs of degenerative changes. Maternal age, parity, ANC, gestational age, presence or absence of fetal heart sound during admission, type of stillbirth, nature of stillbirth, mode of delivery, presence of any obstetric complications, associated medical disorders, fetal sex, birth weight of fetus; and factors potentially contributing to the occurrence of stillbirth in terms of delay in seeking appropriate care: (level-1 delay): because of household, society, financial challenges, delay in reaching healthcare facility; (level-2 delay): because of delay in transfer from home to healthcare facility or to the referral center; (level-3 delay): delay in providing care in the hospital; and no delay were analyzed.

Microsoft Excel 2007 was used to analyze data. Ethical approval was taken from the Institutional Review Committee (IRC) of PAHS.

RESULTS

During the study period, there were 23,069 deliveries in three years. Out of which, 262 were stillbirths, including 4 sets of twins. The stillbirth was 11.24/1000 total births. The perinatal mortality rate was 16.82/1000 total births (Table 1).

Table 1. Perinatal outcome of deliveries at Patan Hospital, PAHS during 3 years

Indicator	Number
Total Deliveries	23,069
Twins Sets	224
Triplets	5
Total Births	23,303
Stillbirths	262
Total Live Births	23,041
Early Neonatal Deaths	130
Stillbirth Rate	11.24/1000 Total Births
Perinatal Mortality Rate	16.82/1000 Total Births

Table 2. Maternal characteristics of stillbirth (n= 258, including 4 sets of twins)

Demographic Characteristics		Number of Still Births	Percentage (%)
ANC	Patan Hospital	119	46.12
	Outside	119	46.12
	No	20	7.76
Age (years)	< 20	9	3.49
	20-34	214	82.95
	≥ 35	35	13.56
Parity	Primi	125	48.45
	Multi	133	51.55

Table 3. Fetal characteristics of stillbirths (n=262)

Fetal Characteristics		Stillbirth (N)	(%)
Type of Stillbirth	Antepartum	234	89.31
	Intrapartum	28	10.69
	Total	262	100
Nature of Stillbirth	Fresh	49	18.70
	Macerated	213	81.30
	Total	262	100
Fetal Heart Sound during admission	Present	69	26.34
	Absent	193	73.66
	Total	262	100
Gestational Age (weeks)	22-27	62	23.66
	28-33	100	38.17
	34-36	51	19.47
	37-41	47	17.94
	> 42	2	0.76
	Total	262	100
Birth Weight (grams)	< 1000	86	32.82
	1000-1499	62	23.66
	1500-2500	81	30.92
	> 2500	33	12.60
	Total	262	100
Fetal Sex	Male	156	59.54
	Female	106	40.46
	Total	262	100
Mode of Delivery	Vaginal Delivery	203	77.48
	Assisted Vaginal Breech Delivery	19	7.25
	Lower Segment Caesarean Section	32	12.22
	Vaginal Birth after Caesarean Section	4	1.53
	Forceps Delivery	2	0.76
	Laparotomy for Rupture Uterus	2	0.76
	Total	262	100

Patients having stillbirths with ANC at Patan Hospital or other centres were 46.12%, whereas 7.76% had no ANCs. Out of 262 still births, 214 (82.95%) were in maternal age of 20-34 years, and 133 (51.55%) were in multigravida (Table 2). Antepartum stillbirths were 234 (89.31%) and 213 (81.30%) were macerated. In 73.66% of the cases, fetal heart sound was absent during admission. One

hundred (38.17%) stillbirths occurred during 28-33 weeks of gestation, and 86 (32.82%) had birth weight < 1000 gm. Male stillbirths were 156 (59.54%). Vaginal delivery was 203 (77.48%), (Table 3). Intrauterine growth restriction observed in 60 (22.90%) stillbirths and no cause was found in 16.41%, (Table 4). Delay in seeking healthcare contributing to 202 (78.30%) stillbirths, (Table 5).

Table 4. Causes of stillbirth (n=262)

Causes of Stillbirths		N	%
IUGR Intrauterine Growth Restriction		60	22.90
Unexplained		43	16.41
Prematurity		28	10.69
Congenital Anomalies		26	9.92
Hypertensive Disorders in Pregnancy	Gestational Hypertension	6	2.29
	Pre-Eclampsia	19	7.25
	Eclampsia	1	0.38
	Chronic Hypertension	3	1.15
Diabetes	Chronic Hypertension with Superimposed Pre-Eclampsia	4	1.54
	Gestational	13	4.96
Overt		2	0.76
Hyperthyroidism		1	0.38
Antepartum Hemorrhage	Abruptio Placenta	13	4.96
	Placenta Previa	4	1.54
Non-Immune Hydrops	Idiopathic	5	1.90
	Twin to Twin Transfusion Syndrome	4	1.54
Rhesus Isoimmunization		1	0.38
Oligohydramnios		8	3.05
Preterm Pre-Labour	Rupture of Membrane	6	2.29
Pruritus of Pregnancy		3	1.15
Malpresentation		2	0.76
Cord Prolapse		2	0.76
Ruptured Uterus	Obstructed Labour	1	0.38
	Previous Caesarean in Labour	1	0.38
Anemia		1	0.38
Maternal Infections	Enteric Fever	1	0.38
	Hepatitis A	1	0.38
	Hepatitis E	1	0.38
	HIV	1	0.38
	Disseminated Tuberculosis	1	0.38
Total		262	100

Table 5. Factors potentially contributing to stillbirth (n=258, 4 sets twins)

Events	Number	Percentage (%)
Delay in Seeking Care (Level 1)	202	78.30
Delay in Reaching Health Facility (Level 2)	32	12.40
Delay in Providing Care in Health Facility (Level 3)	3	1.16
No Delay	21	8.14

DISCUSSIONS

In our study, the stillbirth rate was 11.24/1000 of total births (Table 1). This finding was higher compared to developed countries, Sweden (5.8) and USA (6.6).⁴ The higher stillbirth rate in our study might be due to the inclusion criteria of stillbirths at 22 weeks or more, or fetal birth weight of 500 gm or more, compared to the above two

studies which included birth weight \geq 1000 gm.

Lack of antenatal care is significantly associated with high stillbirth rate, which is also evident in other studies.^{4,5} Stillbirths were found in 7.76% of the patients who had no ANC in our study. Also, only 119 (46.12%) had ANC at Patan Hospital, and same number had ANC elsewhere. This might be due to the lack of awareness of institutional delivery and

delay in referral of complicated cases to our centre.

Stillbirths were higher, 214 (82.95%) in the age group 20-34 years and in multiparae 133 (51.55%), similar to previous studies.^{6,7} The poorer fetal outcome noted among multiparous women might be due to higher incidence of complications such as anaemia, fetal malposition, malpresentation, uterine rupture and medical diseases in pregnancy.⁸

Antepartum and intrapartum stillbirths are strong and direct indicators of quality of prenatal and obstetric care.⁴ Antepartum stillbirths were 89.31% and intrapartum stillbirths were 10.69% observed in our study in contrary to 84.06% antepartum stillbirths and 15.94% intrapartum stillbirths in a study conducted by Bhatia T, et al.⁷ To prevent antepartum stillbirths, improved maternal healthcare during pregnancy is needed, whereas better obstetric care is needed to avoid intrapartum stillbirths.⁹

In our study, macerated stillbirths were 81.30% and fresh stillbirths were 18.70% which are similar to the study conducted by Njoku, et al.⁶ These findings suggest the need for good antenatal care, early detection of problems, prompt referral to prevent macerated stillbirths, whereas better intrapartum fetal monitoring is needed to prevent fresh stillbirths.⁶

In our study, fetal heart was absent in 73.66% of the cases whereas fetal heart sound was present in 26.34% during admission which might be due to the failure to appreciate the significance of less fetal movement and delay in seeking care by the pregnant mothers.

In our study, maximum number of stillbirths in 100 (38.17%) cases occurred during 28-33 weeks of gestation, consistent with the findings of Bhatia T, et al.⁷ The number of stillbirths were 86 (32.82%) in the group with birth weight of <1000 gm, more than the birth weight of 1500-2500 gm, 81 (30.92%). This finding is similar to the study by Bhattacharya S, et al.¹⁰

In this study, stillbirths were seen more in male fetuses 156 (59.54%) than in female fetuses 106 (40.46%), similar to other studies.^{6,7} The reason for male preponderance is unclear but may be linked to the difference in male and female development which begins very early in life.¹¹ Male embryos have faster development and higher metabolic rates than female embryos and this potentially leaves the male fetuses more vulnerable to distress or death from a range of stressors including endocrine fluctuation, oxidative stress and faster nutritional depletion when they encounter stressful conditions.¹¹

Vaginal delivery is the aim unless there are specific indications for lower segment caesarean section (LSCS) in cases of stillbirths.⁷ In our study, vaginal delivery was the most common mode of delivery in 203 (77.48%), whereas LSCS was 32 (12.22%) and laparotomy (done in a case of uterine rupture) was 2 (0.76%), similar to the study of Bhatia T, et al.⁷

Intrauterine growth restriction (IUGR) was found as the most common cause of stillbirths in our study in 60 (22.90%). IUGR has been associated with stillbirths in the study done by Goldenberg et al.¹² In the study by Delke failure to diagnose IUGR despite sufficient clinical indications to suspect it, was found in 34% of stillbirths.¹³ This was different from another study conducted by Njoku, et al in which hypertensive disorders of pregnancy was found as the most common cause of stillbirths.⁶

Raymond and colleagues defined an unexplained fetal death as one without evidence of significant fetal, maternal or placental pathology.¹⁴ In our study, 43 (16.41%) of stillbirths were unexplained which was similar to the study done by Bhatia T, et al.⁷ This finding was higher (23.14%) in the study done by Battacharya S, et al.¹⁰ This highlights the importance of fetal autopsy and histopathological examination of placenta to find out the cause of stillbirths.

Prematurity was found in 28 (10.69%) of the cases in our study because most of the stillbirths were preterm which was similar to the study done by Bhattacharya S.¹⁰

In our study, congenital anomalies were found in 26 (9.92%) stillbirths which were higher compared to other studies.^{10,14} This finding highlights the need of ultrasound assessment of fetal anomaly and genetic screening to all patients who had previous history of delivering anomalous fetus.

Hypertensive disorders in pregnancy contributing to stillbirths included: gestational hypertension 6 (2.29%), pre-eclampsia 19 (7.25%), eclampsia 1 (0.38%), chronic hypertension 3 (1.15%) and chronic hypertension with superimposed pre-eclampsia 4 (1.54%) in our study which were comparatively lower than the study by Bhatia T, et al.⁷ Hypertensive disorders in pregnancy causes stillbirths by uteroplacental insufficiency which leads to chronic anoxia resulting in fetal growth restriction and placental abruption.⁶

Uncontrolled maternal diabetes leads to hyperglycemia and subsequent fetal acidosis. Gestational diabetes was found in 13 (4.96%) and overt diabetes was found in 2 (0.76%) in our study which were higher than in other studies.^{6,7} Hyperthyroidism was found in 1 (0.38%) our study which was lower than the study conducted by Bhatia T, et al.⁷

Antepartum haemorrhage is one of the important causes of stillbirth. In our study, abruptio placenta was found in 13 (4.96%) of the cases and placenta previa was found in 4 (1.54%) which were comparatively less than in other studies.^{6,7}

The cause of non-immune hydrops found in our study was idiopathic in 5 (1.90%) cases and twin to twin transfusion syndrome was 4 (1.54%). Rhesus isoimmunisation was 1 (0.38%) in our study. Rodriguez M, et al. found non-immune hydrops in 6.07% of the cases in which the cause of hydrops was confirmed by autopsy.¹⁵ This further supports the importance of performing an autopsy.

Oligohydramnios was found in 8 (3.05%) cases in our study which was comparable to Bhatia T, et al.⁷

Preterm pre-labour rupture of membrane (PPROM) is another risk factor of stillbirth which is due to increased risk of infection and / or delivery. In our study, PPRM was found in 6 (2.29%) of the cases which was lower than in the study done by Njoku, et al.⁶

Pruritus of pregnancy was found in 3 (1.15%) cases in our study which is lower than in the study conducted by Erodogdu E.¹⁶

Malpresentation was found in 2 (0.76%) of the cases in our study which was consistent with the study done by Bhatia T, et al.⁷ However, this finding is higher (17.48%) in the study conducted by Bhattacharya S, et al.¹⁰

Cord prolapse as a cause of stillbirth was found in 2 (0.76%) cases in our study, higher than in others.^{6,10}

Ruptured uterus was found in obstructed labour 1 (0.38%) which was a delayed referral case to our institution. Another ruptured uterus found in our study was in previous caesarean section in labour 1 (0.38%) at term with defaulted follow up and non-compliance to doctor's advice. The incidence of ruptured uterus found in our study was consistent with the study of Bhatia T, et al.⁷ but less than other studies.^{6,10}

Anemia was found in 1 (0.38%) in our study, lower than others.^{6,7} Maternal infection (such as enteric fever, hepatitis A, hepatitis E, HIV and disseminated tuberculosis) was rarely seen in our study, only 1 (0.38%) in each case (Table 4), lower than the study by Njoku, et al.⁶

The present study identified several events that contributed significantly to the occurrence of stillbirths. They included: delay in seeking appropriate care 202 (78.30%), delay in reaching care 32 (12.40%), delay in providing care 3 (1.16%) and no delay 21 (8.14%). This result supports the importance of prenatal counselling, regular ANC,

awareness about the risk factor of stillbirth, identification of high risk factor before pregnancy and during gestation for appropriate care, timely referral to tertiary care, importance of institutional delivery and monthly perinatal audits to improve the quality of service.

CONCLUSIONS

The stillbirth rate was 11.24/1000 of total births in our study. The leading causes were intrauterine growth restriction, unexplained, prematurity, congenital anomalies, pre-eclampsia, gestational diabetes and abruptio placenta. The delay in seeking care was found as a potential factor contributing to stillbirth.

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